VOCATIONAL EDUCATION IN THE UNITED STATES: THE EARLY 1990S

INTRODUCTION

With passage of the School-to-Work Opportunities Act (STWOA) of 1994, national attention has turned to the systems in place in this country for educating and training people for work. Historically, vocational education has made up the lion's share of such efforts. This publication provides educators, policymakers, and researchers with the most current data on the vocational education enterprise and some data that are available on other school-to-work activities. Specifically, the publication addresses the following questions:

- What is vocational education?
- How widespread is participation in vocational education?
- What types of vocational education do students take?
- Do students take coherent sequences of vocational courses?
- To what extent do students with different demographic characteristics participate in vocational education?
- To what extent do students who are disadvantaged or have disabilities participate in vocational education?
- How much academic preparation do vocational coursetakers receive?
- What outcomes are associated with participation in vocational education?
- What other school-to-work programs do schools and institutions offer?

While most of the above questions are addressed for both the secondary and postsecondary levels, some additional issues particular to each level of education are also discussed.

This report, which was produced about 3 years after publication of *Vocational Education in the United States: 1969–1990*, extends the available vocational education data through 1992, and provides some trend information on the decade spanning 1982–1992. It also provides information on public high school graduates and teachers and on nonbaccalaureate students (those pursuing less than a bachelor's degree) in a variety of postsecondary institutions. Additionally, this report covers a number of key issues emphasized in the Carl D. Perkins Vocational and Applied Technology Education Act Amendments of 1990 (1990 Perkins Act)—and echoed in STWOA. These include integration of academic and vocational education, access of special populations to quality programs, and access of individuals to programs nontraditional for their sex. Finally, this report provides information on most of the targeted populations identified in section 421 of the 1990 Perkins Act:[1]

- Women;
- American Indians;
- Individuals with handicaps;
- Individuals of limited English proficiency;
- Economically disadvantaged students (including students in rural and urban areas);
- Single parents;
- Incarcerated youths and adults; and
- Minorities.

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[1]Section 421 of the 1990 Perkins Act directs the Secretary of Education to establish a national vocational education data system. This publication is in part a response to this legislative mandate. 1990 Perkins Act, Public Law 101-392, Sec. 421.

Appendix B describes how variables were constructed to provide information on the above populations and explains why information on other targeted populations was not included.

This publication incorporates data from nine national databases. Effort was made to include the most recent data that were available during preparation of the report. However, because of the staggered timing of different national data collection efforts, not all desired data were available. Consequently, some of the information presented here is not parallel at the secondary and postsecondary education levels, since the available data differed somewhat at the two levels. Appendix B describes the national datasets that were included in the report and identifies areas where additional information could be provided in the future.

This report begins with text and figures covering the key questions outlined above and highlighting the most important findings. Extensive tables supporting these findings are presented in appendix A, which may be used by readers to investigate a broad range of questions related to vocational education and school-to-work in general. A guide to the tables is provided at the beginning of appendix A; a glossary of key terms used in the report in appendix C; and a bibliography in appendix D.

KEY QUESTIONS

What is vocational education?

The 1990 Perkins Act defines vocational education as "organized educational programs offering a sequence of courses which are directly related to the preparation of individuals in paid or unpaid employment in current or emerging occupations requiring other than a baccalaureate or advanced degree."[2] While vocational education is provided at both the secondary and postsecondary levels, its focus differs somewhat at each level.

Secondary Vocational Education

The objectives of vocational education are more varied at the secondary than at the postsecondary level. Secondary vocational courses can be classified into three types: (1) consumer and homemaking education; (2) general labor market preparation; and (3) specific labor market preparation (figure 1).[3] Specific labor market preparation courses teach students the skills needed to enter a particular occupational field. Such courses can be grouped into the following occupational program areas:[4]

- Agriculture;
- Business and office;
- Marketing and distribution;
- Health;
- Occupational home economics;
- Trade and industry (including construction, mechanics and repairs, and precision production); and
- Technical and communications.

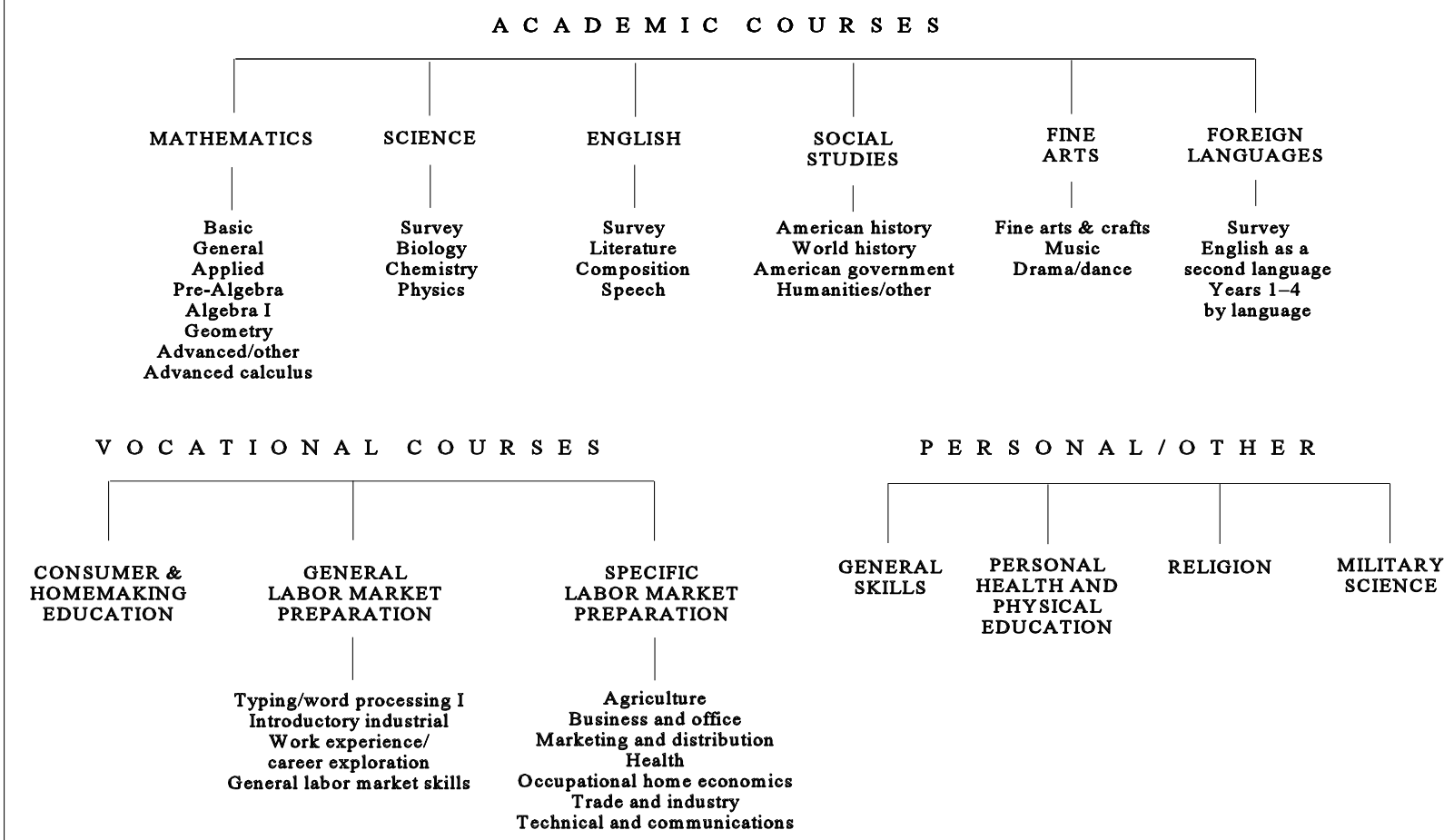
In addition to this occupationally specific curriculum, some secondary vocational courses provide general labor market preparation, teaching general employment skills—such as introductory typing or wordprocessing, industrial arts, career education, and applied academic skills—rather than preparing stu-

[2]The Act goes on to say, "Such programs shall include competency-based applied learning which contributes to an individual's academic knowledge, higher-order reasoning, and problem-solving skills, work attitudes, general employability skills, and the occupational-specific skills necessary for economic independence as a productive and contributing member of society. Such term also includes applied technology education." 1990 Perkins Act, Public Law 101-392, Sec. 521 (41).

[3]A.G. Gifford, E.G. Hoachlander, and J.E. Tuma, *The Secondary School Taxonomy Final Report* (Washington, D.C.: U.S. Department of Education, National Assessment of Vocational Education, February 1989).

[4]For simplicity's sake, the text refers to specific labor market preparation education as the occupationally specific curriculum and to specific labor market preparation programs as occupational programs.

Figure 1—Secondary school taxonomy



SOURCE: A.G. Gifford, E.G. Hoachlander, J.E. Tuma, *The Secondary School Taxonomy* (Washington, D.C.: U.S. Department of Education, National Assessment of Vocational Education, February 1989).

dents for paid employment in a specific occupation. Finally, consumer and homemaking education courses, unlike occupational home economics courses, prepare students for unpaid employment in the home. While this publication provides information on all three types of secondary vocational courses, it focuses primarily on the occupationally specific curriculum.

Vocational education at the secondary level has traditionally had several objectives, including providing students with general employability skills and preparing them to enter paid and unpaid employment in specific occupations. However, in recent years, the goals of vocational education have expanded to include preparing students not only for entry into work but also for career advancement and entry into further education and training. For instance, educators have been called upon to integrate academic and vocational education.

Secondary vocational education is provided primarily through three types of public high schools: (1) comprehensive high schools (the typical U.S. high school); (2) area vocational schools (regional facilities that students attend part of a day to receive their occupational training); and (3) full-time vocational high schools (schools that offer academic studies but focus on preparing students for work in a particular occupation or industry).[5] The latter two types are referred to collectively as vocational schools. The National Assessment of Vocational Education (NAVE) recently found that most secondary vocational education is provided in comprehensive high schools, with vocational schools enrolling about 10 percent of secondary students and accounting for about 12 percent of vocational coursetaking.[6] Because of the limited capacity of available datasets to provide information on the three types of schools, this publication generally treats secondary vocational education as a single system.[7]

While occupationally specific courses are organized into program areas, high school students typically do not formally enroll in an occupational program. Instead, they may take one or more courses in a single occupational program, or courses scattered throughout the occupationally specific curriculum. Moreover, while the majority of students take occupational courses during their high school careers, they do so for a variety of reasons.[8] Some students take introductory business or technical and communications courses to gain hands-on computer experience, whereas others are required by their high schools to complete a vocational course in order to graduate. Only a minority of students complete a coherent sequence of courses preparing them for employment in a specific occupational field.[9] Indeed, the sequence of courses defining an occupational program varies among high schools and school districts across the country.

Consequently, it is not possible—nor very useful—to label students as "vocational students" based on a single definition. Instead, this publication provides several alternative measures of participation in vocational and occupationally specific education at the secondary level. The smallest unit of measure is a course or a credit, and data are provided on the per-

[5]In addition to serving high school students, area vocational schools often enroll postsecondary (for-credit) and adult (noncredit) students.

[6]Section 403 of the 1990 Perkins Act called upon the Office of Education Research and Improvement to conduct a national assessment of vocational education to provide descriptions and evaluations of a broad range of issues pertaining to vocational education (1990 Perkins Act, Public Law 101-392, Sec. 403). The NAVE published its final report to Congress in July 1994 [National Assessment of Vocational Education, *Final Report to Congress* (Washington, D.C.: U.S. Department of Education, Office of Educational Research and Improvement, Office of Research, 1994)]. The statistics provided in the above paragraph can be found in Volume II, chapter 1 of the report.

[7]The exceptions are data on secondary school teachers (tables 114–127) and on school-to-work programs (tables 97–104), which do distinguish between comprehensive high schools and vocational schools.

[8]E. Gareth Hoachlander, Phillip Kaufman, Karen Levesque, and James Houser, *Vocational Education in the United States: 1969–1990* (Washington, D.C.: U.S. Department of Education, National Center for Education Statistics, 1992).

[9]National Assessment of Vocational Education, *Final Report to Congress*, Volume II, chapter 1 (Washington, D.C.: U.S. Department of Education, Office of Educational Research and Improvement, Office of Research, 1994).

centage of public high school graduates completing at least one course and on the average number of credits they earned in different vocational and occupational areas.[10] Some tables provide information on heavy vocational coursetakers, those earning large numbers of vocational or occupationally specific credits.

Additionally, this publication seeks to address the emphasis in the 1990 Perkins Act on providing coherent sequences of vocational courses. The federal regulations associated with the 1990 Perkins Act defined a coherent sequence of courses as "a series of courses in which vocational and academic education are integrated, and which directly relates to, and leads to, both academic and occupational competencies."[11] However, federal datasets rely largely on analyses of student transcripts to determine high school course-taking patterns. While both flexible and reliable, these transcript studies have limited capacity to provide information on the content of courses, such as what specific competencies they teach. Alternatively, this publication uses several measures of concentration in vocational education to examine graduates' propensity to take a series of related vocational courses. Specifically, public high school graduates are identified as vocational "concentrators" if they earned 3 or more credits in a single occupational program, and as vocational "specialists" if they earned 4 or more credits in a single program with at least 2 of these credits beyond the introductory level.[12] Data are also provided on the levels of occupational courses graduates completed, including introductory, second- or higher level, and specialty courses.

Postsecondary Vocational Education

Vocational education at the nonbaccalaureate postsecondary level primarily focuses on providing occupationally specific preparation (figure 2). Postsecondary-level occupational programs generally parallel the program areas identified at the secondary level:

- Agriculture;
- Business and office;
- Marketing and distribution;
- Health;
- Home economics;
- Technical education (including protective services, computers and data processing, engineering and science technologies, and communication technologies); and
- Trade and industry.

While emphasis at the postsecondary level has traditionally been on providing students with skills needed to enter a particular occupational field, these skills have typically been at a more advanced level than those provided through secondary occupational programs.

Postsecondary vocational education is offered at several types of institutions, including public and private, and 4-year and less-than-4-year postsecondary institutions. This publication provides comparable information on participation in six different institutional types: public 4-year institutions; private, nonprofit 4-year institutions; public 2- to 3-year institutions (community colleges); public vocational–technical institutes; private, nonprofit less-than-4-year institutions; and private proprietary (for-profit) institutions.

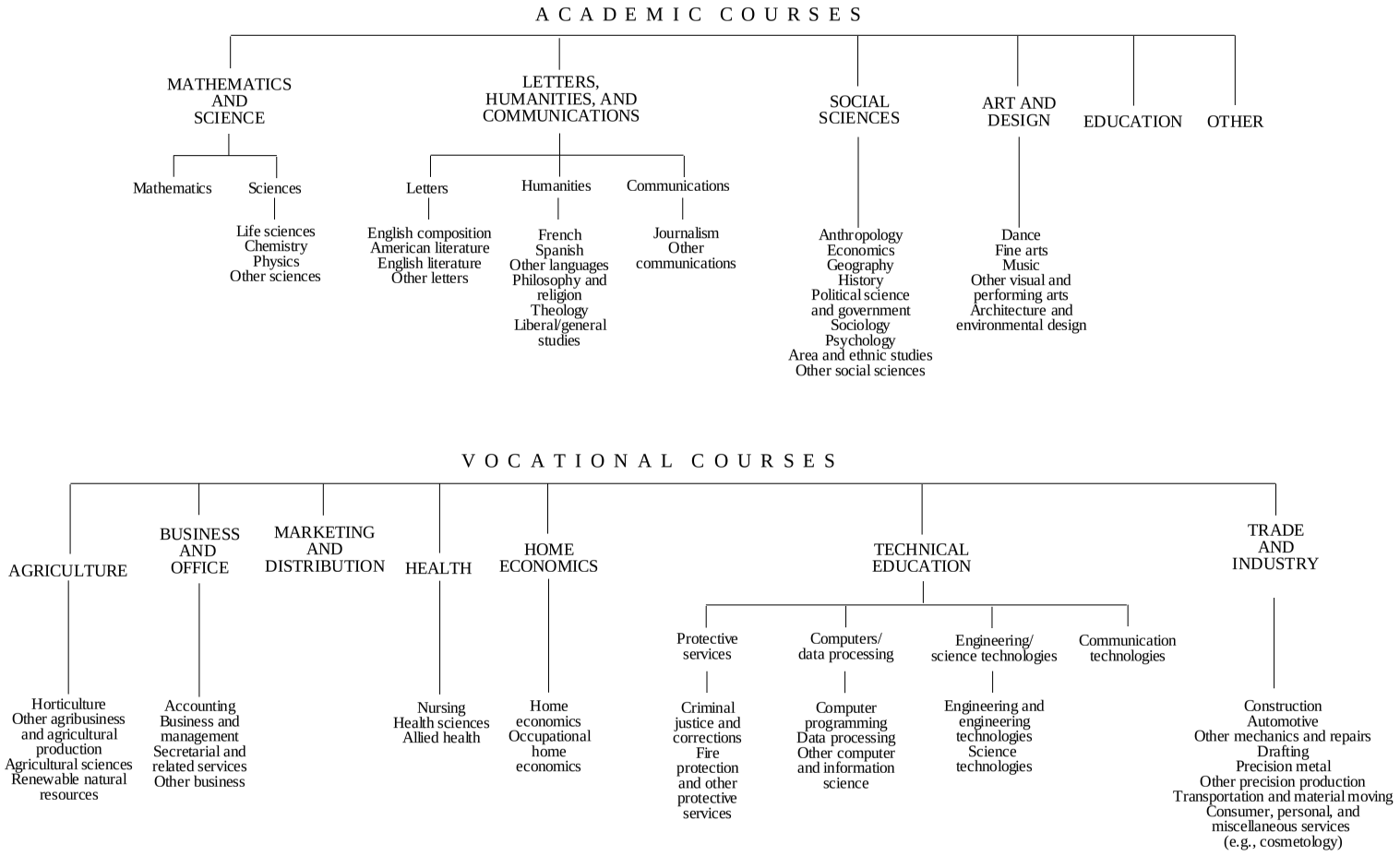
As was the case at the secondary level, postsecondary occupational education is delivered in the form of courses that are organized into program areas. In a few cases, students are required to enroll formally in

[10]In secondary education, 1 Carnegie unit is awarded for the completion of a course that meets 1 period per day for 1 year. For simplicity's sake, this publication refers to a Carnegie unit as a credit.

[11]Vocational and Applied Technology Education Programs—General Provisions, 34 CFR §400.4.

[12]These definitions were originally used by the NAVE. National Assessment of Vocational Education, *Final Report to Congress*, Volume II, chapter 1 (Washington, D.C.: 1994).

Figure 2—Classification of academic and vocational courses for less-than-4-year postsecondary institutions



SOURCE: Susan P. Choy and Laura J. Horn, *A Guide to Using Postsecondary Transcript Data and an Overview of Course Taking in Less-than-Four-Year Postsecondary Institutions* (Berkeley: National Center for Research in Vocational Education, March 1992).

an occupational program. In other cases, students may be required to declare a major upon enrolling in an institution. However, students often sample courses from a variety of program areas, whether or not they have declared a major. This tendency to "mill around" in postsecondary vocational education has been well documented.[13] Moreover, postsecondary institutions, particularly community colleges, serve a student population with diverse educational goals. Some students enter with the intention of completing a degree or certificate, while others intend only to take one or a few courses and then leave. In most cases, it is only possible to identify with accuracy vocational program participants once students have completed a program and obtained a degree or certificate. However, this captures only a portion of nonbaccalaureate postsecondary students.

Because of the timing of this publication, transcript data were unavailable for detailed analysis of participation patterns in postsecondary vocational education. Instead, this report relies on students' self-reported majors. Consequently, in contrast to the secondary level, the discussion of postsecondary vocational education does not provide information on varying levels of participation by students.

How widespread is participation in vocational education?

Secondary Level

Most public high school students participate in vocational education. In 1992, almost all public high school graduates (97 percent) completed at least one vocational education course, and 87 percent completed at least one occupationally specific course (table 1). On average, graduates completed the equivalent of almost four full-year courses in vocational education (3.8 credits), with two and a half of these courses in occupational program areas (table 4).[14]

Although public high school graduates earned greater numbers of total and academic credits over the decade from 1982 to 1992, credits earned in vocational education decreased (table 51). Between 1982 and 1992, total credits earned by high school graduates increased about 11 percent (from 21 to 24 credits), while academic credits earned rose about 22 percent (from 14 to 17 credits). In contrast, over the same period, the average number of vocational credits earned by high school graduates declined by almost 1 full credit, or by about 17 percent. By 1992, vocational coursework made up only 16 percent of the total coursework completed by high school graduates, down from 21 percent in 1982 (figure 3). The National Assessment of Vocational Education (NAVE) found that this declining vocational enrollment might be attributed to several factors, such as increasing high school graduation requirements over the 1982–1992 decade and the vulnerability of secondary vocational programs to local economic conditions.[15]

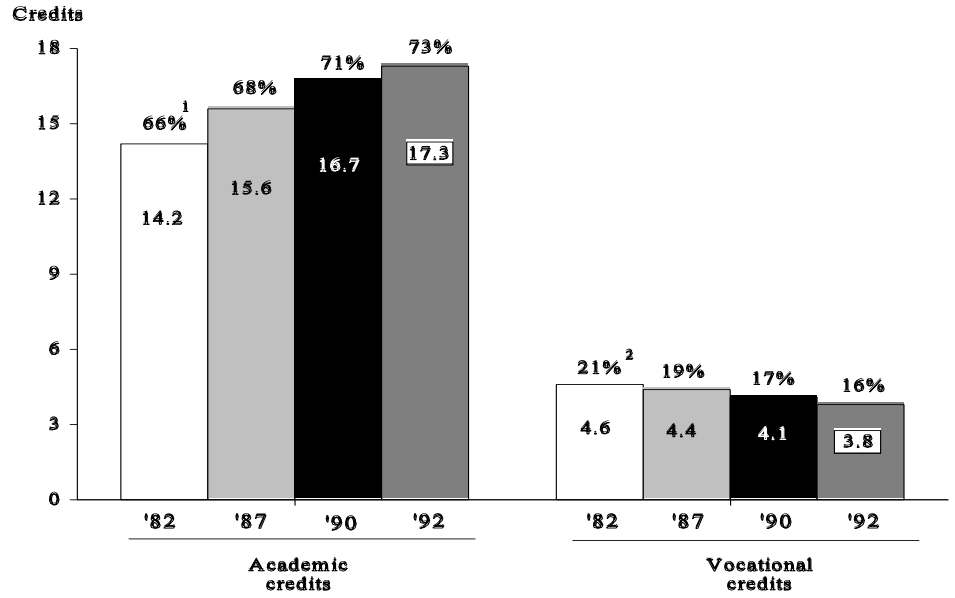
Between 1982 and 1992, participation in the occupationally specific curriculum was somewhat more stable than in other vocational areas (tables 50 and 53). The percentage of public high school graduates completing at least one occupational course remained about the same (at approximately 87 percent), and the average number of credits earned by graduates in occupational programs decreased over the decade by less than half a credit (from 2.9 to 2.5

[13]W. Norton Grubb, *Access, Achievement, Completion, and "Milling Around" in Postsecondary Vocational Education* (Berkeley: National Center for Research in Vocational Education, April 1989).

[14]The recent NAVE found that vocational education is widely available in U.S. high schools. About three-quarters of all comprehensive high schools offer occupational programs, while more than 90 percent offer, at minimum, introductory vocational courses. Additionally, almost all comprehensive high schools either offer vocational courses or provide access to area vocational schools. National Assessment of Vocational Education, *Final Report to Congress*, Volume II, chapter 1 (Washington, D.C.: 1994).

[15]Local economic conditions affecting vocational programs included both the loss of jobs for which programs trained students and the loss of educational funding that often accompanied a poor economy. Ibid.

Figure 3—Average number of credits earned by public high school graduates in academic and vocational courses, and the percentage of total credits earned in high school that those credits represent: 1982–1992



[1]The 14.2 academic credits earned on average by 1982 public high school graduates represented 66 percent of the total credits earned by those graduates.
[2]The 4.6 vocational credits earned on average by 1982 public high school graduates represented 21 percent of the total credits earned by those graduates.

SOURCE: The High School and Beyond Sophomore Cohort 1982 High School Transcript Study, the 1987 and 1990 High School Transcript Studies, and the National Education Longitudinal Study, "Second Follow-up and High School Transcript Files," 1992.

credits) or by about 14 percent. In contrast, both the percentages of graduates participating in the consumer and homemaking and the general labor market preparation curricula and the average number of credits graduates earned in these areas declined significantly over the decade (with average credits earned declining about 29 and 36 percent in these respective areas).

Postsecondary Level

The NAVE found that 5.8 million students were enrolled in postsecondary vocational education in 1990, making up about 35 percent of all undergraduate postsecondary enrollments.[16] Vocational enrollments represented an even larger share of the nonbaccalaureate undergraduate population, with about one-half of these students reporting that they were majoring in a vocational program area (table 58). In contrast, one in four nonbaccalaureate postsecondary students reported an academic major and one in four were taking personal or avocational courses (for example, basic skills and citizenship activities).[17] Nonbaccalaureate students at all types of postsecondary institutions reported majoring in

[16]Ibid., chapter 2.

[17]Although the National Postsecondary Student Aid Study (NPSAS) excludes students taking not-for-credit courses, about one in four nonbaccalaureate students in the 1989–90 NPSAS sample reported majoring in program areas that were classified by the Classification of Instructional Programs (CIP) as "personal improvement or leisure" programs. See *A Classification of Instructional Programs*, 1990 Edition, Washington, D.C.: U.S. Department of Education, National Center for Education Statistics, U.S. Government Printing Office, 1990.

vocational programs, although the proportion of the nonbaccalaureate student body that was vocationally oriented varied by institution type (table 64). For example, at public 4-year postsecondary institutions about one-third of nonbaccalaureate students reported majoring in vocational programs, while at public vocational–technical institutes 90 percent of nonbaccalaureate students were in the vocational curriculum.[18]

What types of vocational education do students take?

Secondary Level

Business was the most popular occupational program at the high school level, with more than half of all 1992 high school graduates completing at least one business course (table 16). Business was followed in popularity by trade and industry and then by technical and communications programs.

Although overall participation in the occupationally specific curriculum declined somewhat over the decade from 1982 to 1992, trends varied by program area. The percentage of graduates completing at least one course in the technical and communications area, as well as the average number of credits earned in this program area, increased between 1982 and 1992 (tables 55 and 56). In contrast, both the percentage of graduates completing at least one trade and industry course and the average number of trade and industry credits earned declined over the decade. The NAVE found that these occupational enrollment patterns appeared to follow labor market trends.[19]

Postsecondary Level

As was the case at the secondary level, the most popular postsecondary vocational program was business, with about 17 percent of all nonbaccalaureate students declaring a major in this area (table 70). Business was followed in popularity by health (11 percent) and then trade and industry (8 percent) programs.[20] The combined technical fields (computers and data processing, engineering and science technologies, protective services, and communications technologies) accounted for 12 percent of all nonbaccalaureate majors (figure 4).

Program enrollment varied significantly by institution type (table 70). Students at private proprietary; private, nonprofit 4-year; and public 2- to 3-year institutions were more likely to major in business than students at public 4-year institutions. In contrast, students at public vocational–technical institutes and private proprietary schools were much more likely to major in trade and industry than students at all other postsecondary institutions.

Do students take coherent sequences of vocational courses?

Vocational Concentration and Specialization at the Secondary Level

The NAVE found that concentrating one's vocational coursetaking resulted in higher earnings, especially if students entered training-related jobs.[21] However, few 1992 graduates completed a sequence of courses providing significant preparation in a single occupational area. About 24 percent of high school graduates were vocational "concentrators," earning 3 or more credits in a single occupational program, and about 8 percent of graduates were vocational "specialists," earning 4 or more credits in a single program with at least 2 of these credits beyond the introductory level (tables 34 and 37). Lack of focused coursetaking was not restricted to the vocational curriculum. The majority of high school graduates (60 percent) failed to meet the criteria for

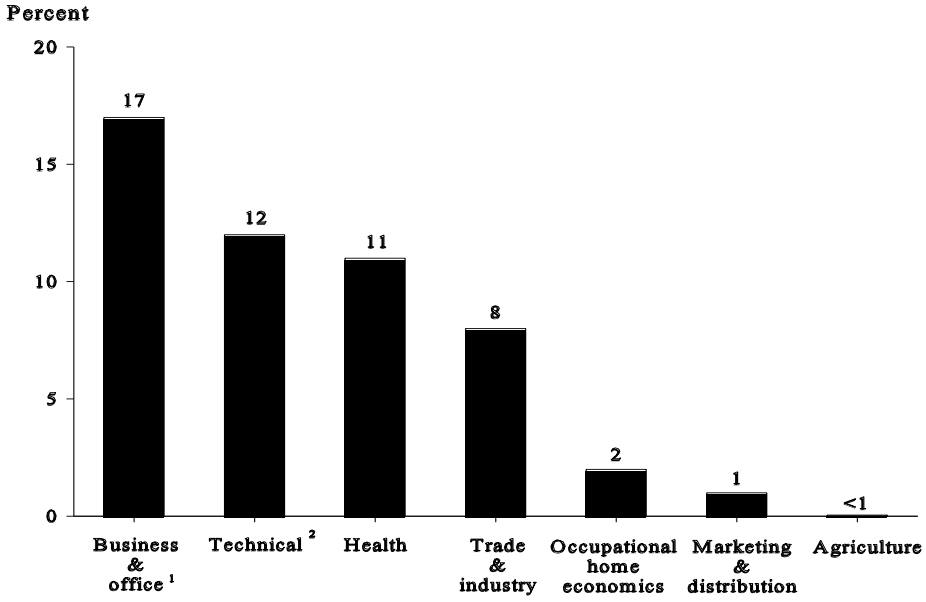
[18]Although all students enrolled in public vocational–technical institutes are typically considered to be vocational, some of the students surveyed declared they were enrolled in academic programs such as law, education, and journalism and communications.

[19]National Assessment of Vocational Education, *Final Report to Congress*, Volume II, chapter 1 (Washington, D.C.: 1994).

[20]Students majored in health and in trade and industry programs at statistically similar rates.

[21]National Assessment of Vocational Education, *Final Report to Congress*, Volume II, chapter 6 (Washington, D.C.: 1994).

Figure 4—Percentage of nonbaccalaureate postsecondary students majoring in vocational fields, by program area: 1989–90



[1]Of all nonbaccalaureate postsecondary students, 17 percent reported majoring in business and office.
[2]Technical combines: computers/data processing, engineering/science technologies, protective services, and communications technologies program areas.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1990 National Postsecondary Student Aid Study.

either the college preparatory or vocational specializations (figure 5 and table 34).[22]

While graduates were more likely to complete at least one course in business than in any other occupational area, they were more likely to concentrate in trade and industry programs. Specifically, 10 percent of 1992 high school graduates earned 3 or more credits in trade and industry, while 8 percent earned this number of business credits (table 37). Nearly half of all vocational concentrators concentrated in the trade and industry curriculum, although business was the most frequent vocational concentration among college preparatory graduates. Technical and communications and health programs had the fewest concentrators among all graduates, perhaps due to a lack of available courses. The disparity between a high level of coursetaking and low level of concentration in business and in technical and communications may be due to students electing not to concentrate in these areas. The NAVE attributed the disparity to many students seeking computer-related coursework through these programs rather than specific occupational preparation.[23]

[22]Graduates were classified as "college preparatory" if they completed 4 or more credits in English; 3 or more credits in math, with 1 or more of those credits in algebra or higher; 3 or more credits in science, with 1 or more of those credits in chemistry or physics; and 2 or more credits in a single foreign language. Students who met both the vocational specialist and college preparatory criteria were included in the vocational specialist group.

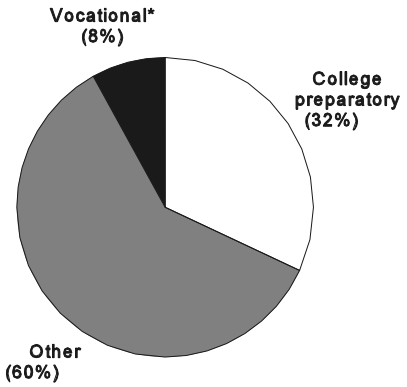
[23]National Assessment of Vocational Education, *Final Report to Congress*, Volume II, chapter 1 (Washington, D.C.: 1994).

Levels of Vocational Coursetaking at the Secondary Level

High levels of vocational coursetaking in high school did not always mean that graduates completed advanced occupational courses. In fact, 20 percent of 1992 high school graduates who earned 8 or more vocational credits and about 25 percent of those who earned 4 or more occupationally specific credits did not take a single occupational course above the introductory level (table 25). Among all graduates, twice as many took introductory occupational courses as took advanced ones (75 percent compared with 35 percent).[24]

Rates of advanced course completion varied by program concentration. Vocational concentrators in marketing were more likely than concentrators in other program areas to take advanced courses in their area of concentration (86 percent of marketing concentrators took advanced marketing courses) (table 31).[25] In contrast, concentrators in occupational home economics were less likely than those in most other program areas to take advanced courses in their concentration (40 percent took such courses).[26]

Figure 5—Percentage of 1992 public high school graduates, by area of specialization



*Among 1992 public high school graduates, 8 percent specialized in vocational education, earning 4.00 or more credits in a single occupationally specific program area, with a least 2.00 of those credits beyond the introductory level.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Education Longitudinal Study, "Second Follow-Up and High School Transcript Files," 1992.

To what extent do students with different demographic characteristics participate in vocational education?

Sex and race–ethnicity were related to differences in participation in vocational education at both the secondary and postsecondary levels.

Secondary Level

High school vocational course-taking patterns differed for males and females. Male graduates in 1992 earned about one-third more occupationally specific credits, while female graduates earned almost twice as many consumer and homemaking education credits (table 4). Furthermore, the percentages of males and females completing at least one occupational course differed significantly in all program areas except marketing (table 16). In particular, males in 1992 were more than twice as likely to complete at least one course in agriculture and in trade and industry, while females were more than twice as likely to complete at least one course in health and in occupational home economics (figure 6).

[24]The NAVE found that throughout 1982–1992 graduates earning large numbers of vocational credits were less likely both to concentrate their coursetaking in a specific program area and to earn advanced credits within their concentration. The NAVE speculated that the increasing lack of program concentration may be due to a number of factors, including students taking vocational courses for avocational reasons; students anticipating more complex job demands and moving toward an interdisciplinary type of training by taking coursework in several program areas; or students simply being less focused in their coursetaking. Ibid.

[25]The percentage of marketing concentrators completing second or higher level courses in marketing was not statistically higher than the percentage of trade and industry concentrators completing higher level courses in trade and industry.

[26]The percentage of occupational home economics concentrators completing second or higher level courses in their concentration was not statistically different from the percentage of health and technical and communications concentrators completing such courses in their respective concentrations.

Between 1982 and 1992, there was little increase in the percentage of students participating in occupational programs that were nontraditional for their sex (table 55).[27] The gender gap in trade and industry narrowed over the decade, although this narrowing was *not* due to more females completing courses in this program area. Rather, the gap narrowed because of a drop in participation for males. Moreover, the gap in participation for males and females remained about the same in agriculture, health, and occupational home economics. However, while females in 1982 were more than one and a half times as likely as males to participate in business, this gap narrowed significantly by 1992.

The patterns of vocational concentration for males and females were similar to those for coursetaking (tables 34 and 37). Males were more likely than females to be vocational concentrators and specialists, while females were more likely to be in the college preparatory track. Additionally, males were more likely to concentrate in agriculture, trade and industry, and technical and communications, while females were significantly more likely to concentrate in business, health, and occupational home economics.[28]

High school vocational course-taking patterns also differed based on race–ethnicity. Native Americans appeared to earn above average numbers of vocational and occupationally specific credits, and Asians below average numbers of these credits, although these differences were not statistically significant possibly due to the small sample sizes for these groups (table 4). Native American graduates also appeared both to concentrate and specialize in vocational education at above average rates, although these differences were once again not statistically significant (tables 34 and 37). However, Native Americans had higher than average rates of concentration in trade and industry programs, and lower than average rates in programs offering computer coursework, including business and technical and communications. White,[29] black,[30] and Hispanic graduates differed little from the overall pool of high school graduates in terms of the numbers of vocational and occupationally specific credits they earned and their rates of concentration and specialization. These groups also exhibited no consistent patterns of over- or underparticipation in specific occupational programs.

Postsecondary Level

The majority (57 percent) of nonbaccalaureate postsecondary students in 1989–90 were female (table 90). In fact, females represented the majority of the student populations at five of the six types of postsecondary institutions in the study, with the exception of public vocational–technical institutes, where males and females participated at similar rates. This enrollment pattern was reflected among students who reported majoring in vocational programs, with the majority (54 percent) of all vocational majors being female. Females were in the minority among vocational majors at public 4-year institutions only.

Most (74 percent) nonbaccalaureate postsecondary students in 1989–90 were white (table 90). However, the racial–ethnic composition of students varied markedly by institution type. While three-quarters or more of nonbaccalaureate students at public and private 4-year institutions, public 2- to 3- year institutions, and public vocational–technical institutes were white, more than 40 percent of private proprietary students were from a minority group.[31]

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[27]For the purposes of this publication, an occupational program was identified as nontraditional if one gender group was two or more times as likely as the other to participate in the program in 1992.

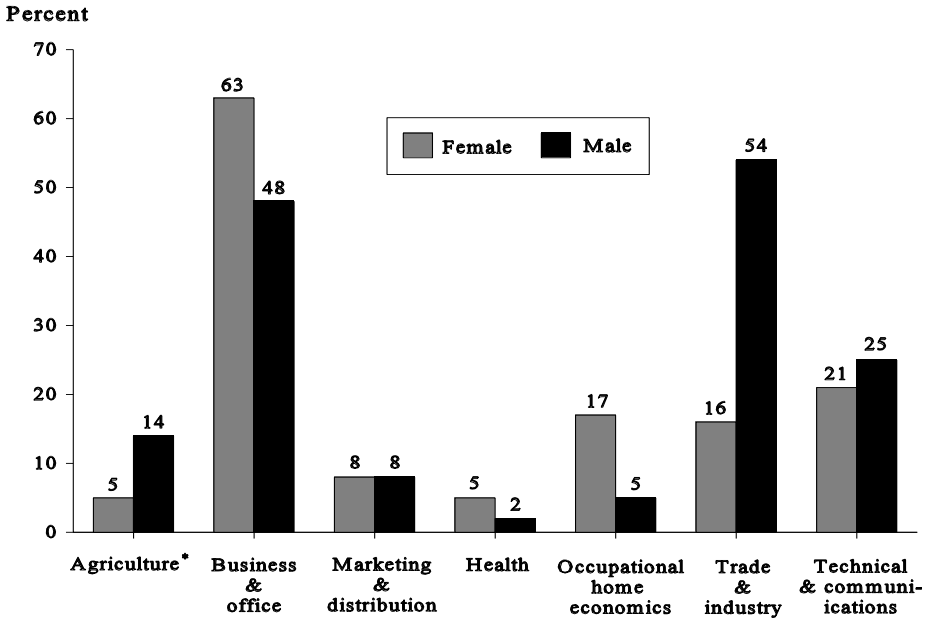
[28]The NAVE found that the gender imbalance in occupational programs was greater among concentrators than among all graduates taking one or more course in these areas. National Assessment of Vocational Education, *Final Report to Congress*, Volume II, chapter 1 (Washington, D.C.: 1994).

[29]In this publication, the term *white* refers to white, non-Hispanic persons.

[30]In this publication, the term *black* refers to black, non-Hispanic persons.

[31]The NAVE suggested that the overrepresentation of minorities in private proprietary schools might be due to the fact that these schools are concentrated in urban areas, while public subbaccalaureate institutions are mostly located outside cities. National Assessment of Vocational Education, *Final Report to Congress*, Volume II, chapter 2 (Washington, D.C.: 1994).

Figure 6—Percentage of 1992 public high school graduates completing one or more courses in occupational programs by program area, by sex



*Among 1992 public high school graduates, 5 percent of females and 14 percent of males completed at least one agricultural course.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Education Longitudinal Study, "Second Follow-Up and High School Transcript Files," 1992.

These patterns persisted among students reporting vocational majors.

Black nonbaccalaureate students reported majoring in vocational education at above average rates, with almost two-thirds of this racial–ethnic group majoring in a vocational program area in comparison with about half of all students (table 59). Even after controlling for socioeconomic background, the NAVE found that black postsecondary students were more likely than all other groups to major in vocational areas.[32]

To what extent do students who are disadvantaged or have disabilities participate in vocational education?

Secondary Level

Public high school graduates in 1992 who were members of special populations were generally more likely than other graduates to participate in vocational education overall and in occupationally specific education. Graduates in lower socioeconomic quartiles; students with disabilities, lower grade point averages, and greater numbers of accumulated remedial credits; and both student parents and expecting students were more likely to participate than

[32]Ibid.

other students.[33] These special populations were more likely to complete at least one course in vocational education overall and in occupationally specific education (table 2). In addition, they generally earned greater numbers of vocational and occupationally specific credits than their counterparts who were not members of special populations (table 5 and figure 7).[34] However, English proficiency was not related to vocational participation. Limited-English proficient graduates participated at roughly equal rates as English proficient graduates in vocational education and occupationally specific education and earned roughly similar numbers of credits in these curricula.

Members of most special population groups were also more likely than other graduates to concentrate and specialize in vocational education (tables 35 and 38). Students in lower socioeconomic quartiles and students with disabilities, lower grade point averages, and greater numbers of accumulated credits in remedial coursework were more likely than other students to be both vocational concentrators and specialists. Limited-English proficient students were more likely than their English proficient counterparts to be vocational concentrators.[35] Given their high levels of vocational coursetaking, the propensity of students with disabilities and economically and academically disadvantaged students to concentrate their coursetaking in a single occupational program area—and to earn at least 2 credits in that program area above the introductory level—was a positive indication that these students were not simply taking scattered, lower level vocational courses.

Special population students were somewhat less likely than other graduates to concentrate in programs offering exposure to computer coursework (table 38). Students in lower socioeconomic quartiles and students with lower grade point averages and greater numbers of accumulated credits in remedial coursework were more likely than their economically and academically advantaged counterparts to concentrate in occupational home economics and trade and industry. Students with disabilities were more than twice as likely as nondisabled students to concentrate in trade and industry, and were less likely to concentrate in technical and communications. Additionally, students accumulating greater numbers of credits in remedial coursework were less likely than other students to concentrate in business. However, students in lower socioeconomic quartiles were more likely than their more affluent counterparts to concentrate in business.

Postsecondary Level

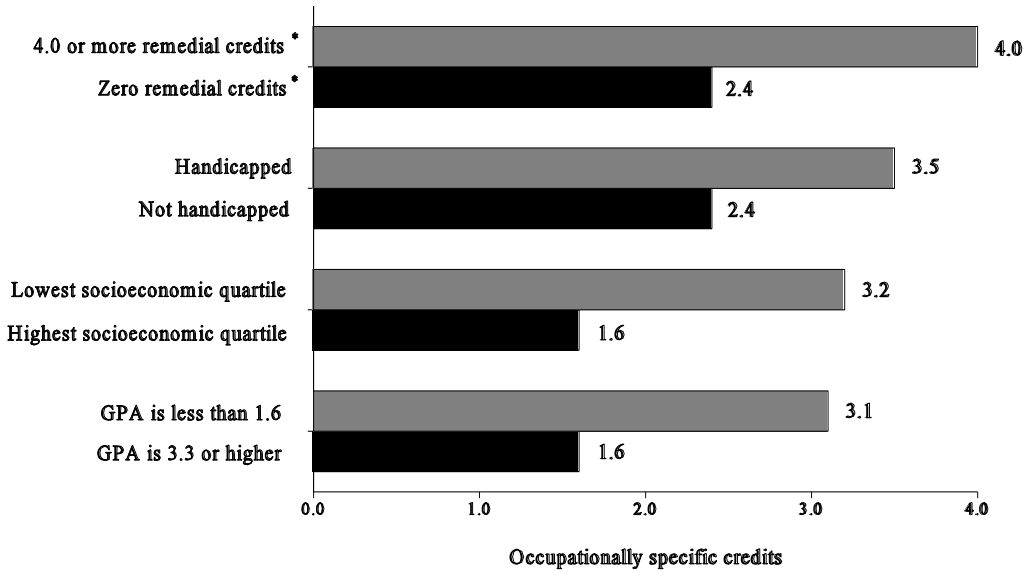
Economically disadvantaged students and unmarried students with dependents were more likely to report a vocational major than other nonbaccalaureate postsecondary students, but academically disadvantaged and disabled students were no more likely to do so (table 60). Specifically, during the 1989–90 academic year, nonbaccalaureate postsecondary students from families in lower socioeconomic quartiles were more likely to report majoring in a vocational program than students from affluent families. Additionally, unmarried students with dependents were more likely than all other groups to major in vocational education. In contrast, there was no consistent relationship between grade point average and majoring in vocational education, and disabled students were no more likely than their nondisabled peers to report a vocational major.

[33]The NAVE found that special populations, particularly academically disadvantaged and disabled students, made up a growing proportion of the vocational and occupational course-taking population over the last decade. Several factors may have contributed to this trend. First, special populations decreased their vocational coursetaking less than other students during these years. As a result of this differential decline, "the overrepresentation of special population students in vocational education" increased. Second, the Perkins Act encouraged districts to maximize the participation of special populations in vocational education. Finally, the NAVE suggested that as vocational enrollments decline, "special population students are often easier to recruit, in part because regular programs are more willing to let them go. Comprehensive high schools, often reluctant to send students to area vocational schools because they may lose funds by doing so, are more willing to send more costly, hard-to-educate students to AVSs." Ibid.

[34]The differences between student parents and expecting students and their counterparts in the number of occupationally specific credits earned were not statistically significant.

[35]Limited-English proficient students also appeared more likely to be vocational specialists, but this difference was not statistically significant.

Figure 7—Average number of credits accumulated by 1992 public high school graduates in occupationally specific courses, by special population status



*1992 public high school graduates who earned 4.0 or more credits in remedial coursework accumulated on average 4.0 credits in occupationally specific courses. In contrast, graduates who earned no credits in remedial coursework accumulated on average 2.4 credits in occupationally specific courses.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Education Longitudinal Study, "Second Follow-Up and High School Transcript Files," 1992.

Incarcerated Persons

Section 421 of the 1990 Perkins Act called upon the Department of Education to report information on the participation of incarcerated persons in vocational education.[36] The National Adult Literacy Survey (NALS) provided the first national data on this group. NALS revealed that about one-third of federal and state prison inmates aged 16 or over in 1992 had received vocational training during their current period of incarceration (table 96). Whether inmates received vocational training varied by educational attainment. Inmates with a high school diploma or GED, or with some college education, were more likely than inmates with lower educational attainment to receive vocational training as their sole educational activity. However, inmates participated in a combination of vocational and nonvocational activities at similar rates regardless of their educational attainment.

How much academic preparation do vocational coursetakers receive?

Academic Coursetaking at the Secondary Level

In 1992, fewer than one in five public high school graduates met all of the academic standards established in *A Nation At Risk* for noncollege-bound

[36]The 1990 Perkins Act included individuals in correctional institutions among special populations groups. Public Law 101-392, Section 521(31).

graduates (table 40).[37] Graduates earning more credits in vocational education were less likely than graduates with fewer accumulated vocational credits to meet the standards in each subject area, except for computer science. Increased vocational coursework was associated with higher rates of compliance with the computer science standard. Additionally, graduates concentrating in the "high tech" fields of technical and communications and business were more likely than other vocational concentrators to meet all of the *A Nation At Risk* standards, and were just as likely as nonconcentrators to do so. These technical and business concentrators were also more likely than other vocational concentrators to specialize in the college preparatory curriculum, and technical concentrators were just as likely as graduates with no vocational concentration to do so (table 34).[38]

As the number of vocational credits that 1992 public high school graduates earned rose, the number of academic credits they earned decreased in all subject areas (table 41). However, the rate of tradeoff between academic and vocational credits varied across academic subject areas. For example, as graduates earned greater numbers of vocational credits, the decline in academic credits they earned was smaller for English and social studies and greater for foreign language than it was for other academic subjects (figure 8).[39] Additionally, the rate of tradeoff between vocational and advanced academic credits varied across academic subject areas. As graduates earned greater numbers of vocational credits, the decline in advanced math credits they earned was greater than the decline in math credits in general. However, there was no significant difference between the rates of decline in advanced and general English and science courses.

Generally, as vocational coursetaking increased, students not only earned fewer credits in academic subject areas but also completed more of their academic coursework at lower levels. For example, as 1992 public high school graduates earned increasing numbers of credits in vocational education, they also earned more credits in remedial English, in math at levels lower than Algebra 1, and in survey science courses (tables 43, 45, and 47). As previously discussed, these patterns may reflect the fact that academically disadvantaged students were more likely than their advantaged counterparts to participate heavily in vocational education.

Efforts to Integrate Academic and Vocational Education

In an effort to improve the quality of both academic and vocational education, the 1990 Perkins Act encouraged secondary schools and postsecondary institutions to integrate these curricula.[40] By the spring of 1992, most schools and institutions reported some integration efforts (tables 97 and 100). However, most of these efforts involved enhancing existing vocational courses—rather than significantly restructuring the academic and vocational curricula—and did not appear to receive a substantial new allocation of resources, particularly in terms of allocating teachers' time. The following discussion

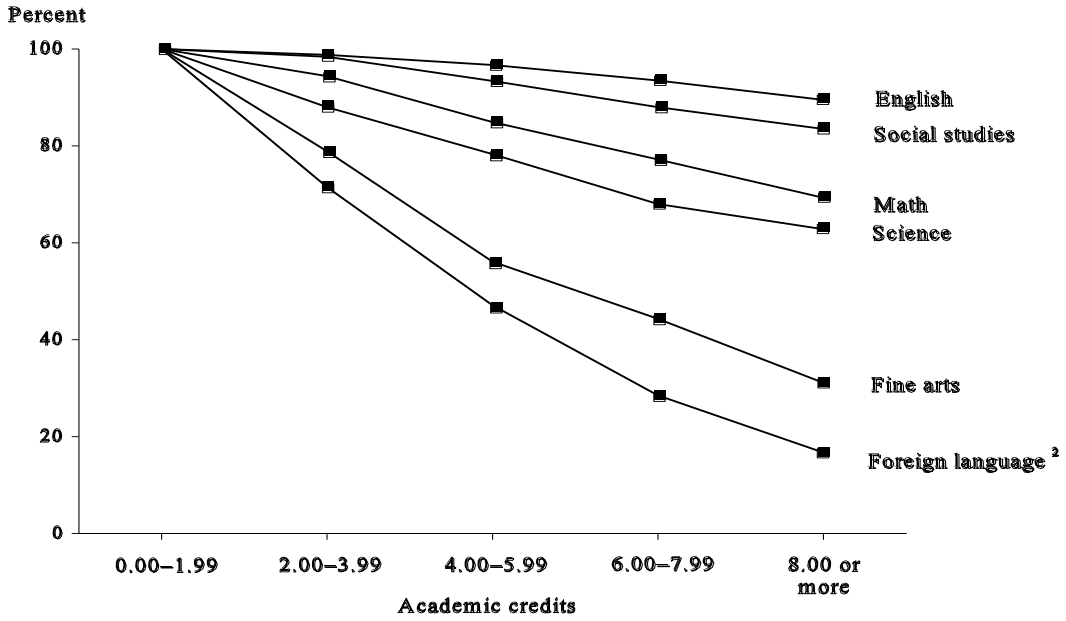
[37]New Basics standards for noncollege-bound high school graduates include 4 years of English, 3 years of math, 3 years of science, 3 years of social studies, and a half year of computer science. National Commission on Excellence in Education, *A Nation At Risk: The Imperative for Educational Reform* (Cambridge, MA: USA Research, 1983).

[38]However, while technical and communications and business concentrators appeared at least twice as likely as marketing and distribution concentrators to specialize in the college prep curriculum, these differences were not statistically significant.

[39]However, the difference between foreign language and fine arts was not statistically significant.

[40]Although the 1990 Perkins Act did not define the term *integration of academic and vocational education*, some research has been done on the forms that such integration takes in schools. In *The Cunning Hand, the Cultured Mind*, Grubb et al. identified eight integration models that differ in approach and ambition: (1) incorporating more academic content in vocational courses; (2) combining vocational and academic teachers to enhance academic competencies in vocational programs; (3) making the academic curriculum more vocationally relevant; (4) curricular alignment by modifying both vocational and academic courses; (5) the senior project as a form of integration; (6) the academy model or schools-within-schools; (7) occupational high schools and magnet schools; and (8) occupational clusters, "career paths," and occupational majors. See W. Norton Grubb et al., *The Cunning Hand, the Cultured Mind: Models for Integrating Vocational and Academic Education*, Berkeley: National Center for Research in Vocational Education, July 1991.

Figure 8—Academic credits earned by public high school graduates as a percent of academic credits earned by graduates with low participation in vocational education,[1] by subject area and number of vocational credits accumulated: 1992



[1]Those graduates with fewer than 2.00 vocational credits are considered to have low participation in vocational education.
[2]1992 public high school graduates accumulating 8.00 or more vocational credits earned 17 percent of the foreign language credits earned by graduates accumulating fewer than 2.00 vocational credits.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Education Longitudinal Study, "Second Follow-Up and High School Transcript Files," 1992.

provides examples of integration efforts undertaken at both the secondary and postsecondary levels.

Secondary level. At the secondary education level, more than 80 percent of public high schools offering vocational courses reported taking some action to integrate academic and vocational education by the 1991–92 school year (table 97). Vocational schools (including full-time and area or regional vocational high schools) were more likely than comprehensive high schools to have begun integration efforts. Among schools taking integration steps, vocational schools were also more likely to report efforts to integrate occupational programs.

The most frequently used method of integrating academic and vocational education was to incorporate employability or generic work skills, such as SCANS skills, into vocational courses (table 97).[41] Additionally, when academic and vocational teachers worked together, they were more likely to collaborate on developing academic materials for vocational courses, or applied materials for academic courses, than to collaborate on other efforts, such as team

[41]The Secretary's Commission on Achieving Necessary Skills (SCANS) identified five competencies needed for employment, including (1) identifying, organizing, planning, and allocating resources; (2) working with others; (3) acquiring and using information; (4) understanding complex interrelationships; (5) working with a variety of technologies; and a three-part foundation of skills, including (1) basic skills; (2) thinking skills; and (3) personal qualities. The Secretary's Commission on Achieving Necessary Skills, *What Work Requires of Schools: A SCANS Report for America 2000* (Washington, D.C.: U.S. Department of Labor, June 1991).

teaching or developing coordinated academic and vocational courses.[42] Finally, teachers had regularly scheduled time to work together on integration efforts at fewer than one-quarter of the secondary schools reporting such efforts.

Postsecondary level. At the postsecondary education level, almost all institutions (more than 96 percent) reported taking some action to integrate academic and vocational education by the 1991–92 school year (table 100). The most common integration efforts involved increasing the basic skills of vocational students (through supporting remedial or developmental education) and establishing general education competencies for these students.

The most common way in which faculty were involved in developing integrated curricula was reviewing general education requirements or developing academic materials to be incorporated into existing vocational courses. Faculty members had regularly scheduled time to work on integration efforts at about one-quarter of community colleges and vocational–technical institutes, and at about one in ten area or regional vocational schools serving postsecondary students.

What outcomes are associated with participation in vocational education?

Mathematics Achievement at the Secondary Level

A recent study of the relationship between coursetaking and achievement found that increased academic coursetaking was consistently associated with higher mathematics achievement, and increased vocational coursetaking with lower mathematics achievement, as measured by a National Assessment of Educational Progress (NAEP) achievement test.[43] Specifically, 1990 public high school graduates who scored in higher test quartiles on the NAEP mathematics assessment earned more academic and fewer vocational credits than did graduates in lower test quartiles (tables 107 and 108). Furthermore, as the number of vocational credits that graduates accumulated rose, their mathematics test scores tended to decrease (tables 105 and 106). The study indicated that these patterns persisted for males and females and graduates in all racial–ethnic groups.

The study cautioned against assuming a causal relationship between vocational coursetaking and lower mathematics achievement based on these findings. Because the study examined achievement at a single point in time, it was unable to isolate students' prior ability or achievement and, therefore, to control for preexisting differences—or "selection effects"—between students who completed greater and fewer numbers of vocational courses.[44] A related study found that while certain academic courses contributed to cognitive gain, vocational courses generally had a neutral effect on cognitive growth.[45] Thus, the lower mathematics achievement of graduates with greater numbers of accumulated vocational credits may reflect their completing fewer academic courses rather than more vocational courses. In addition, the tendency of heavy vocational coursetakers to complete a large proportion of their academic courses at lower levels, as noted earlier in this report, may also contribute to these low math test scores.

[42]However, the percentages of educators in comprehensive high schools developing applied materials for academic courses and either team teaching or developing coordinated courses were not statistically different.

[43]The study reported similar findings for science and reading achievement. Alexander C. McCormick, John Tuma, and James Houser, *Vocational Course Taking and Achievement: An Analysis of High School Transcripts and 1990 NAEP Assessment Scores* (Washington, D.C.: U.S. Department of Education, National Center for Education Statistics, May 1995).

[44]The study suggested that researchers and policymakers interested in the causal relationships between coursetaking and achievement should use longitudinal data to examine achievement *gains*, with careful controls for other explanatory factors. Ibid.

[45]K.A. Rasinski, *The Effect of High School Vocational Education on Academic Achievement Gain and High School Persistence: Evidence from NELS:88*, Draft Report (Chicago: National Opinion Research Center, 1994).

Postsecondary Employment and Earnings Outcomes

Among the general population, only about one in five adults aged 18–34 in the summer of 1990 had completed a postsecondary degree or certificate, and about one-fourth of those completers earned their highest postsecondary award in a vocational field (table 109). Vocational completers were more likely than persons never attending a postsecondary institution to be employed (table 110). However, while they appeared more likely than postsecondary noncompleters to be employed, this difference was not statistically significant. Vocational completers were employed at similar rates as nonvocational associate's degree or certificate holders, and were slightly less likely to be employed than bachelor's degree holders.[46]

During the summer of 1990, about one-half of all employed postsecondary vocational completers aged 18–34 worked in a field related to their training (table 111). Training-related employment appeared to make no difference in the constancy with which postsecondary vocational completers were employed between the summer of 1990 and the winter of 1992 (table 112).[47]

Although relatedness of employment to postsecondary vocational training did not appear to be related to employment stability, it was positively associated with earnings in the summer of 1990 (table 113).[48] For example, 39 percent of postsecondary vocational completers employed in a field related to their training earned more than $2,000 per month, while 30 percent of those employed in an unrelated field had this level of earnings. In contrast, 25 percent of vocational completers employed in an unrelated field earned less than $1,100 per month, while 17 percent of those employed in a related field earned this little.

What other school-to-work programs do schools and institutions offer?

In addition to offering classroom-based courses, secondary schools and postsecondary institutions often provide opportunities for work-based learning, such as cooperative education, work experience, and school-based enterprises. Cooperative education and work experience programs allow students to earn school credit in conjunction with paid or unpaid employment. Cooperative education programs place students in jobs related to their vocational field of study, and typically involve employers in developing a formal training plan and evaluating students. On the other hand, traditional work experience programs sometimes place students in vocationally unrelated jobs, and may not involve employers as extensively as cooperative education programs.[49] School-based enterprises are class-related activities that engage students in producing goods or services for sale or use to people other than the participating students themselves.

Secondary level. About one-half of public high schools in 1991–92 offered cooperative education programs (table 98). In contrast, fewer than one-third offered school-based enterprises and other work experience programs. Vocational schools were more likely than comprehensive high schools to offer each of these programs. Among vocational schools, area vocational schools were more likely than full-time vocational high schools to offer school-based enterprises and other work experience programs.

[46]A pattern of increasing labor market returns to education was documented by Kane and Rouse. These researchers found that persons who attended 2- and 4-year colleges earned about 5 percent more than high school graduates for every year of postsecondary credits earned, regardless of whether they attained a postsecondary degree. See Thomas J. Kane and Cecilia Rouse, "Labor Market Returns to Two- and Four-Year Colleges: Is a Credit a Credit and Do Degrees Matter?", Working Paper #4268 (Cambridge, MA: National Bureau of Economic Research, January 1993).

[47]For example, 79 percent of vocational completers employed in a field related to training were employed throughout the time studied, while 77 percent of those employed in an unrelated field were consistently employed.

[48]The NAVE found that training-related employment also had a positive impact on the earnings of secondary vocational completers. NAVE, *Final Report to Congress*, Volume II, chapter 6 (Washington, D.C.: 1994).

[49]The School-to-Work Opportunities Act of 1994 encourages states to expand work-based learning opportunities for high school students and details methods for developing meaningful experiences. Public Law 103-239.

On average, 1992 public high school graduates accumulated 0.15 credits in cooperative education and work experience courses—equivalent to about one in seven graduates completing a year-long course (table 22). College preparatory graduates and graduates without a college preparatory or vocational specialization averaged negligible numbers of such credits (0.04 and 0.09, respectively). However, vocational specialists averaged about 1 credit in cooperative education and work experience, equivalent to a full-year course. High school students concentrating in marketing and distribution and in health completed more cooperative education and work experience coursework as part of their occupational programs than did other vocational concentrators.[50]

Postsecondary level. Three-quarters of community colleges reported offering cooperative education or work experience programs in 1991–92 (table 103). In contrast, about half of public postsecondary vocational–technical institutes and area vocational schools serving postsecondary students reported offering these programs. Fewer than one-sixth of all postsecondary institutions offered school-based enterprises, with area vocational schools that served postsecondary students being more likely than community colleges and vocational–technical institutes to offer these programs.

ADDITIONAL QUESTIONS FOR SECONDARY VOCATIONAL EDUCATION

How do vocational and nonvocational teachers differ from one another?

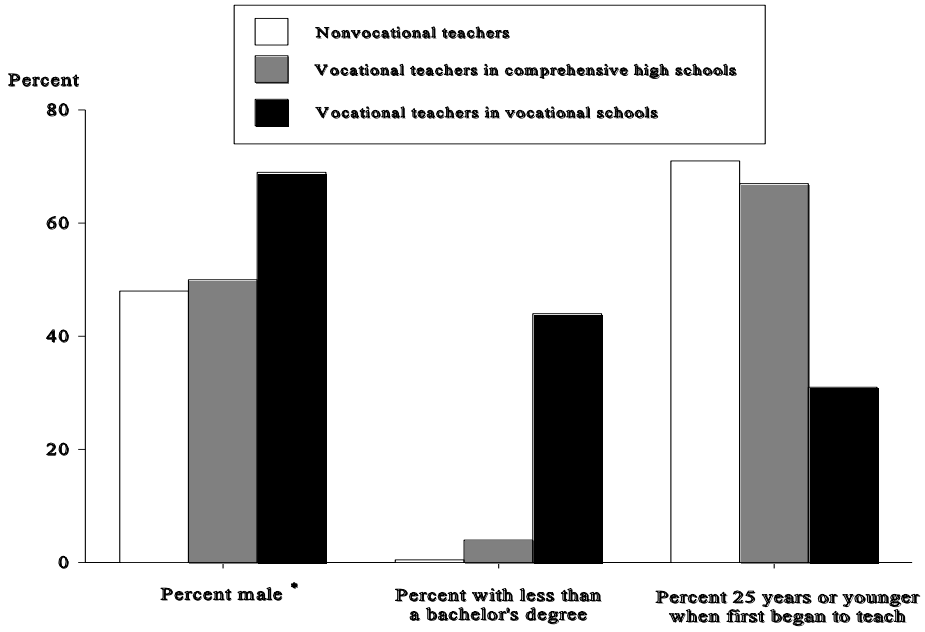
Differences between vocational and nonvocational teachers in 1990–91 had more to do with the types of schools in which vocational teachers taught, and the types of occupational programs that they taught, than with their being vocational or nonvocational teachers. Vocational teachers in comprehensive high schools were similar to nonvocational teachers, while vocational teachers working in vocational schools (including full-time vocational high schools and area vocational schools) were markedly different from other teachers. In part, these differences reflect that vocational teachers in vocational schools were more likely than their counterparts in comprehensive high schools to teach in the trade and industry, technical, and health areas.

Vocational teachers in comprehensive high schools were equally as likely as nonvocational teachers to be male (table 114). In contrast, vocational teachers in vocational schools were much more likely than their counterparts in comprehensive high schools to be male, with about two-thirds of vocational teachers in vocational schools being male in 1990–91.

Similarly, vocational teachers in comprehensive high schools were more similar to nonvocational teachers than to vocational teachers in vocational schools, in terms of the highest degree earned and the age at which they first began to teach (figure 9 and table 115). Vocational teachers in comprehensive high schools were only slightly more likely than nonvocational teachers to have earned less than a bachelor's degree, with the vast majority (more than 95 percent) of both groups earning at least a bachelor's degree. In contrast, 44 percent of vocational teachers in vocational schools held less than a bachelor's degree. Furthermore, vocational teachers in comprehensive high schools were only slightly older than nonvocational teachers when they first began to teach, with at least two-thirds of both groups having been 25 years or younger when they first taught. On the other hand, more than two-thirds of vocational teachers in vocational schools were over the age of 25 when they began to teach. These findings suggest that vocational teachers in vocational schools may have been more likely than their counterparts in comprehensive high schools to have worked in their vocational fields before they entered teaching.

[50]However, credits earned by health concentrators were not statistically different from credits earned by business and occupational home economics concentrators.

Figure 9—Characteristics of public high school vocational and nonvocational teachers, by teacher and school type: 1990–91



*About 48 percent of all nonvocational teachers and 50 percent of vocational teachers who taught in comprehensive high schools were male, compared with 69 percent of vocational teachers who taught in vocational schools.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1990–91 Schools and Staffing Survey.

Vocational teachers in trade and industry, technical, and health areas were more likely to teach at vocational schools than were vocational teachers in other occupational areas (table 118).[51] For example, more than one-third of trade and industry and of technical teachers and more than one-quarter of health teachers taught at vocational schools, while 5 percent or fewer of agriculture, business and accounting, career education, home economics, and industrial arts teachers taught at these schools. Trade and industry as well as technical teachers were more likely than other vocational teachers to have earned less than a bachelor's degree and, along with health teachers, were older when they first began to teach (table 117).[52] These findings suggest that these teachers may have been more likely than other vocational teachers to enter the teaching profession after working for some years in industry.

How much do vocational teachers earn?

In 1990–91, vocational and nonvocational teachers earned similar salaries (an average of $31,595 for vocational teachers compared with $32,145 for nonvocational teachers) (table 121). Vocational teachers' salaries increased with number of years of

[51]The only exceptions were that technical and health teachers were not statistically more likely than teachers in the "other" vocational category to teach at vocational schools.

[52]Technical teachers were not more likely than health and "other" vocational teachers to have earned less than a bachelor's degree, and technical and health teachers were no less likely than teachers in the "other" and "mixed" categories to be age 25 or younger when they first began to teach.

teaching experience. Additionally, vocational teachers in suburban schools earned more than those in urban schools, who in turn earned more than vocational teachers in rural areas. While vocational teachers with a master's or higher degree earned more than their counterparts with less postsecondary education, there was no significant difference between the earnings of vocational teachers with a bachelor's degree and those with less than a bachelor's degree. This similarity in earnings may reflect the practice in some states of compensating vocational teachers for industry experience.[53]

How large are vocational classes and teaching loads?

Vocational classes tended to be smaller than nonvocational classes, and the average number of students for whom vocational teachers were responsible was smaller than for nonvocational teachers (tables 122 and 123). Specifically, vocational classes contained, on average, 17 students, while nonvocational classes contained 22 students. Furthermore, the size of vocational classes was fairly constant across school types, with vocational classes in comprehensive high schools containing only slightly more students than vocational classes in vocational schools. The average number of students vocational teachers instructed per week was lower than the number nonvocational teachers instructed (89 students compared with 113 students). However, vocational teachers in vocational schools instructed significantly fewer students per week than their counterparts in comprehensive high schools (75 students compared with 90 students). While vocational teachers in vocational schools had nearly as many students per class, they may have taught fewer classes than their counterparts in comprehensive high schools.[54]

[53]See "The State of Certification," *Vocational Education Journal* 68 (6) (September 1993): 30–35.

[54]For example, area vocational schools typically block schedule their classes, offering two to four sessions per day. In contrast, comprehensive high schools schedule six or seven class periods per day, although some vocational classes may meet for two consecutive periods.

ADDITIONAL QUESTIONS FOR POSTSECONDARY VOCATIONAL EDUCATION

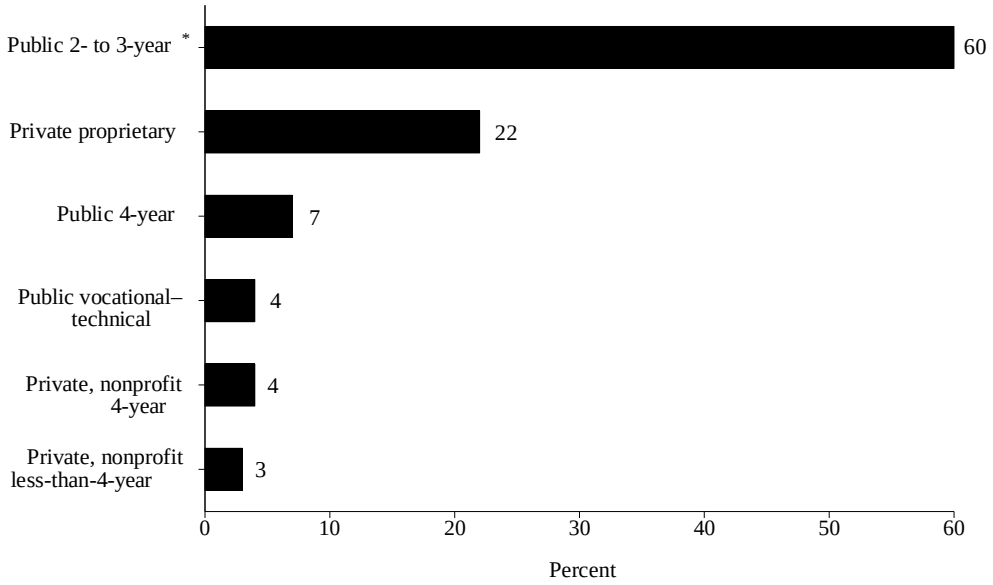
What institutional sectors have the largest vocational education enrollments?

Public 2- to 3-year institutions (community colleges) were the largest providers of postsecondary vocational education in 1989–90, enrolling 60 percent of all nonbaccalaureate postsecondary students reporting a vocational major (table 61). Private proprietary institutions were the second largest vocational providers, serving about 22 percent of all nonbaccalaureate vocational students. The remaining 18 percent of vocational students were served by public 4-year; public vocational–technical; private, nonprofit 4-year; and private, nonprofit less-than-4-year institutions (figure 10). Four-year institutions together served about 11 percent of all postsecondary vocational students.

How do students reporting vocational majors differ from those reporting academic ones?

There were marked differences between students reporting vocational and academic majors (tables 89–93). Vocational majors were somewhat more likely than their academic counterparts to be male and to be from a racial–ethnic minority. Vocational majors were also older and were more likely to be economically independent from their parents. However, contrary to some widely held beliefs, vocational majors were also more likely than academic majors to be enrolled full time and to be working toward a formal degree or certificate rather than taking individual courses. Vocational majors were less economically well off than their academic peers and were more likely to be unmarried with dependents. They were also more likely to be receiving financial aid, perhaps because of a combination of factors, including their greater full-time attendance status, greater economic independence, and poorer economic background.

Figure 10—Percentage of nonbaccalaureate vocational majors attending different types of postsecondary institutions: 1989–90



*In 1989–90, 60 percent of all nonbaccalaureate postsecondary vocational majors attended public 2- to 3-year institutions.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1990 National Postsecondary Student Aid Study.

How much financial aid do vocational students receive?

Among 1989–90 nonbaccalaureate postsecondary students, almost one-half of those who reported majoring in vocational education received some sort of financial aid (table 94). In contrast, one-third of students reporting academic majors and one-quarter of those reporting other majors received financial aid. Of those students who received financial aid, almost three-quarters (73 percent) of vocational majors received some sort of federal aid, compared with about two-thirds of academic majors (66 percent). State and institutional financial aid sources funded fewer students—22 percent and 25 percent of vocational majors, respectively.[55]

On average, aided students majoring in a vocational area received about $3,000 in federal aid in 1989–90, in comparison with about $1,200 in both state and institutional aid (table 95). Vocational majors were also more likely to receive federal grants than federal loans, with the largest federal grant source being Pell grants, and the largest loan source being Stafford loans (table 94). More than one-half of all vocational financial aid recipients received a Pell grant. However, the average Pell grant to vocational majors was smaller than the average Stafford loan ($1,400 compared with $2,300).

[55]The state and institutional financial aid categories included both need-based and merit-based aid.

CONCLUSION

Vocational education involves a broad range of activities, including occupationally specific, general labor market, and consumer and homemaking coursework; school- and work-based experiences; and integrated academic and vocational curricula. While participation in the traditional high school vocational curriculum has declined somewhat over the 1982–1992 decade, efforts to reform vocational education in both high schools and postsecondary institutions have expanded in recent years.

The data presented in this publication are many and varied. They provide a fairly detailed picture of vocational education, particularly at the secondary level. Several broad themes recur and are summarized below.

Participation of Special Populations

At both the secondary and postsecondary levels, economically disadvantaged students were more likely than their advantaged counterparts to participate heavily in vocational education. Among public high school graduates, those from families in lower socioeconomic quartiles were more likely to complete three or more courses (to "concentrate") in a single occupational program area and to complete two or more advanced courses (to "specialize") in that program area (tables 35 and 38). Among nonbaccalaureate postsecondary students, those from families in lower socioeconomic quartiles were more likely than their higher socioeconomic counterparts to report majoring in a vocational program area (table 60).

Economic disadvantage aside, the participation patterns of special populations differed at the two educational levels. While academically disadvantaged students and students with disabilities were more likely than their counterparts to concentrate and specialize in vocational education in high school, they were not more likely to major in vocational education at the postsecondary level. Furthermore, unmarried postsecondary students with dependents were more likely to report majoring in vocational education, while high school graduates who were parents or were expecting while in high school were no more likely to concentrate or specialize in high school vocational programs than other graduates.

Academic Preparation of Vocational Coursetakers

A number of findings presented in this report describe the academic preparation of vocational coursetakers. Taken together, they paint a troublesome, but potentially improving, picture. To begin with, as public high school graduates earn more vocational credits, they tend to earn fewer academic ones (table 41). Given the limited number of class periods available during the school day and year, such a tradeoff may be necessary to enable students to participate in the vocational curriculum. Moreover, graduates who complete large numbers of vocational courses tend to give up more foreign language courses than other academic courses.[56] However, the remaining academic coursework of heavy vocational coursetakers includes fewer advanced academic courses and more remedial and survey-type coursework (tables 43, 45, and 47). The combination of completing fewer academic courses overall and fewer advanced and more lower level academic courses may contribute to the finding that students earning more vocational credits have lower NAEP academic achievement test scores (tables 105 and 106). Another contributing factor may be the tendency of high school students from special populations to participate in vocational education at relatively high rates. Against this background, however, high schools reported that efforts to infuse more academic materials into vocational courses were among their most common integration activities (tables 97 and 100).

Varied Profiles of Vocational Students and Teachers

A third theme emerging from this report is that no single description fits all vocational students or teachers, particularly at the secondary level. Instead, profiles vary by vocational program area. For example, business was the most common vocational concentration among college preparatory graduates (table 37), and business concentrators were more likely than all other vocational concentrators except

[56] *A Nation At Risk* did not include foreign language among its coursework standards for students who were not college bound.

technical and communications ones to meet all of the *A Nation At Risk* academic coursework standards (table 40). Additionally, female graduates were significantly more likely than male graduates to concentrate in business (table 37), and graduates accumulating greater numbers of remedial credits were significantly *less* likely to concentrate in this area (table 38). In contrast, male, Native American, and economically and academically disadvantaged graduates were more likely than their counterparts to concentrate in trade and industry (tables 37 and 38).

Vocational teachers also differed according to the vocational subjects they taught. For example, vocational teachers in trade and industry, technical, and health areas were more likely to teach at vocational schools than agriculture, business and accounting, career education, home economics, and industrial arts teachers (table 118). Furthermore, trade and industry teachers and technical teachers were more likely to have earned less than a bachelor's degree and, along with health teachers, were older when they first began to teach than other vocational teachers.

In conclusion, vocational education encompasses diverse objectives, activities, providers, and participants. No single description of the vocational education experience covers all situations. Experiences vary among education levels, types of schools and institutions, vocational program areas, and groups of students and teachers. This publication presents a wide array of data that shed light on these different experiences and help to understand the complex nature of the U.S. vocational education system in the early 1990s.